# USABO 101A

## Course Description & Goals

USA Biology Olympiad (USABO) is the premier biology competition for high school students. USABO 101 program focuses on preparing highly motivated students for qualification of USABO semifinal and beyond in the long run. Over the course of around 1 year, all the topics which come up in the AP biology exam and additional topics in USABO exam will be covered. This course is suitable for students who are interested in learning advanced biology. Students will learn the fundamental concepts of biology, which will not only prepare them for USABO201, but also provide valuable preparation for the AP Biology Exam and biology/chemistry-related school classes such as Biology, H. Biology, AP Biology and Chemistry. All lectures are given in English.

## Instructor

John Kim – STEM & ROOT Academy Founder

## Tentative Class Schedule

**2025 Spring:** 1/11-6/7 (21 sessions, 42 hours), 10AM-12PM (PT), Saturdays
**No Class: 3/22 (Spring break)*

**2025 Summer:** 6/14-8/9 (16 sessions, 32 hours), 11AM-1PM (PT), Wed, Sat
**No Class: 7/5 (Independence day)*

**2025 Fall:** 8/16/2025-1/31/2026 (22 sessions, 44 hours), 10AM-12PM (PT), Saturdays

**No Class: Thanksgiving week, Winter break (2 weeks)*

**USABO Exam Date: February 2026*

## Key Features of the Program

- 100% instruction by the founder
- English-only, Live Zoom Classes
- Recorded lectures provided in case of absences
- Homework and grading included for every class
- 3–6 free practice exams (including remote proctoring and grading) are available during the later stages of the program.
- We will provide all class materials (Lecture notes, Study guides, Quizzes, Simulation Tests, etc.)

## Class Format

- Lecture

1) Zoom (Live Online)

2) Recorded Video- If the live class schedule does not work, we offer the option to take the entire semester through recorded sessions. All homework and materials will be provided, and homework submissions will be graded in the same way as for live classes.

- Google Classroom
  - Providing Lecture Materials and other materials
  - Assigning / grading HW
  - Communicating with students
  - Keeping students informed of current and upcoming events

## Make-up Policies

- If a student is unable to attend a class, we will provide a recording of the live lecture. Additionally, the full class content will be available in our Google Classroom, allowing students to stay on track and complete their homework.
- After attending the live class, if students request a recording for review, we provide it.
- Make-up recording will be available until the following class. Make sure to watch it as soon as possible to keep your pace. If an extension is needed, we will grant it upon request.
- Students/parents must notify STEM & ROOT Academy as promptly as possible of any absence.

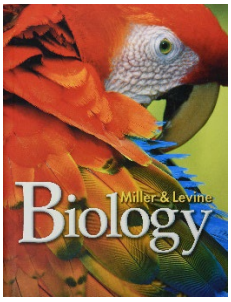
## Class Materials

- **We will provide all class materials** (Lecture notes, Study guides, Quizzes, Simulation Tests, etc.) **except the textbooks.**

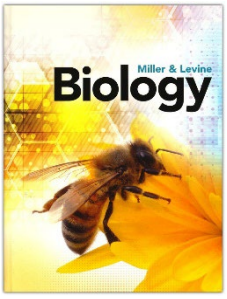
- 3- ring binder (or other organizer of choice for lecture notes and handouts): **Lecture materials should be printed out** and organized in order.

- **Textbooks** (**Purchase** via Thriftbooks, Amazon, Chegg, etc. **prior to the first class**)

  **1. Biology**, Miller & Levine, Pearson – An easier book for self-study recommended for those without any previous background in biology. If you already have a basic biology textbook, there is no need to purchase this textbook.



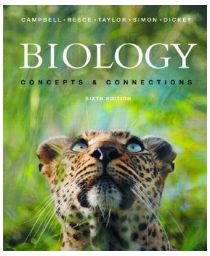
2014 edition



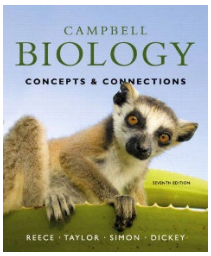
2019 edition

2014 Edition: ISBN-10: 0133235742 / ISBN-13: 9780133235746
2019 Edition: ISBN-10: 0328925128 / ISBN-13: 9780328925124

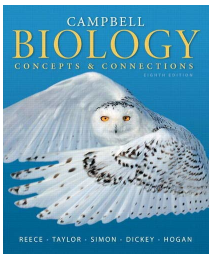
**2. Campbell Biology: concepts & connections** (6th edition or newer), Campbell, Reece, Taylor et al., Pearson – This is the main textbook. Any book from 6th edition or newer is acceptable.



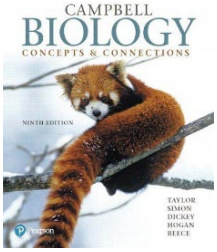
6th



7th



8th



9th

6th Edition: ISBN-10: 0321489845 / ISBN-13: 9780321489845
7th Edition: ISBN-10: 0321696816 / ISBN-13: 9780321696816
8th Edition: ISBN-10: 0321885325 / ISBN-13: 9780321885326
9th Edition: ISBN-10: 013429601X / ISBN-13: 9780134296012

## Class Policies, Expectations and Rules

- Join every class on time (**5 min prior to each class**) with your materials (lecture notes, textbook, supplementary handouts) out and ready.
- Spend at least 30 minutes (**right before each class**) reviewing/previewing materials.
- Turn on webcam and **show your face**. I would like to see what you are up to, just as you would be required to attend in-person classes.
- **Take notes** while listening to my lecture.
- **Actively participate in Q&A** during the class.
- **Submit weekly assignments on time** (due date/time for each HW will be set/notified via google classroom)
- Eating and drinking is allowed only if it does not cause any distraction.

## Assignments & Self -Study

1. **Study Guide**: The study guide posted in our Google Classroom should be used for self-study and as preview/review material. After each class, complete the corresponding study guide up to the topic covered during the class, by referring to the lecture notes and textbook. Answer keys to the study guide will be posted at the end of each chapter. Students will need to review incorrect questions.

2. **End of Chapter Quiz (Closed book)** – I expect students to miss **no more than 5** questions. If you miss more than 5 questions, it indicates that you need to spend more time on self-study, including review/preview, and pay more attention during class.

3. **Review of Incorrect Questions -** Before class starts, you need to correct the missed questions on the quiz and the study guide. Additionally, if you have any questions that you cannot answer or do not understand, make a list before class, and ask those questions in class. We will go over them together.

## Academic Dishonesty

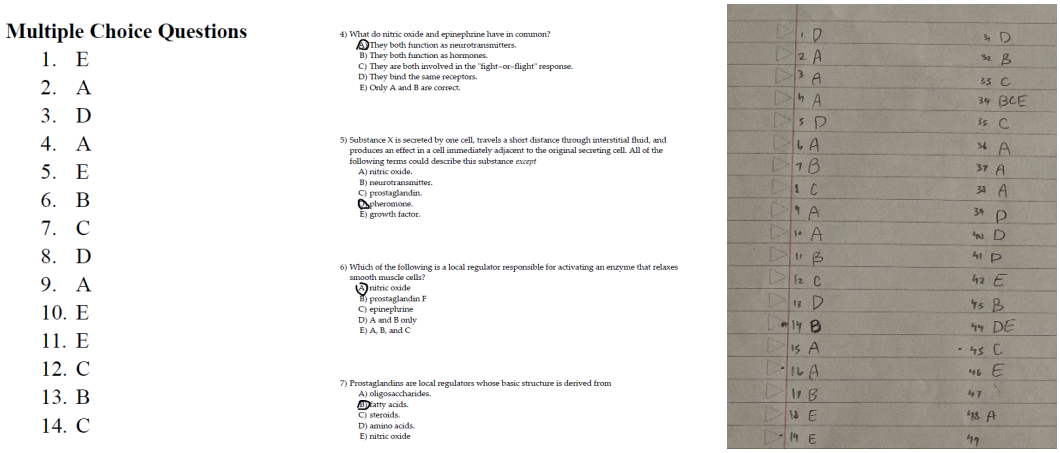
Plagiarism (the practice of taking someone else's work or ideas and passing them off as one's own) is a severe offense. Examples of academic dishonesty include (not an exhaustive list): **copying work from another student or the internet, using online searches to find answers to questions**, posting answers to assignments online.

## Assignment Submission

- Homework must be submitted by **7PM (PT) a day before** the following class. Assignments will be graded as soon as possible such that students have enough time to make corrections and know what questions to ask before class.

- Your homework must be submitted as **"one" PDF or google doc file only**. (**No photos such as .jpeg)**

- **Recommended PDF file converters or apps** to write on PDF files
  - For PC, use www.combinepdf.com : jpeg → PDF conversion
  - For Mac/Ipad: GoodNotes, Notability, Documents, Onenote, etc.
  - No Kami App– not compatible with google classroom. But if you still want to use Kami, generate PDF file using the app first and use www.combinepdf.com to do PDF → PDF conversion. Submit PDF file generated from the "combinepdf.com"



**Multiple Choice Questions**

1. E
2. A
3. D
4. A
5. E
6. B
7. C
8. D
9. A
10. E
11. E
12. C
13. B
14. C

4) What do nitric oxide and epinephrine have in common?
A) They both function as neurotransmitters.
B) They both function as hormones.
C) They are both involved in the "fight-or-flight" response.
D) They bind the same receptors.
E) Only A and B are correct.

5) Substance X is secreted by one cell, travels a short distance through interstitial fluid, and produces an effect in a cell immediately adjacent to the original secreting cell. All of the following terms could describe this substance *except*
A) nitric oxide.
B) neurotransmitter.
C) prostaglandin.
D) pheromone.
E) growth factor.

6) Which of the following is a local regulator responsible for activating an enzyme that relaxes smooth muscle cells?
A) nitric oxide
B) prostaglandin F
C) epinephrine
D) A and B only
E) A, B, and C

7) Prostaglandins are local regulators whose basic structure is derived from
A) oligosaccharides.
B) fatty acids.
C) steroids.
D) amino acids.
E) nitric oxide



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**Class curriculum & Textbook Reading Schedule – Campbell Biology C&C**

| | Campbell Concepts & Connections | Theme |
|---|---|---|
| Ch 1 | The Life of the Cell | **Intro** |
| Ch 2 | The Chemical Basis of Life | **Biochemistry** |
| Ch 3 | The Molecules of Cells | **Cell Biology** |
| Ch 4 | A Tour of the Cell | |
| Ch 5 | The Working Cell | |
| Ch 6 | How Cells Harvest Chemical Energy | |
| Ch 7 | Photosynthesis: Using Light to Make Food | |
| Ch 8 | The Cellular Basis of Reproduction and Inheritance | **Genetics** |
| Ch 9 | Patterns of Inheritance | |
| Ch 10 | Molecular Biology of the Gene | **Molecular Biology** |
| Ch 11 | How Genes Are Controlled | |
| Ch 12 | DNA Technology and Genomics | |
| Ch 13 | How Populations Evolve | **Evolution** |
| Ch 14 | The Origin of Species | |
| Ch 15 | Tracing Evolutionary History | |
| Ch 35 | Behavioral Adaptations to the Environment | **Ecology** |
| Ch 36 | Population Ecology | |
| Ch 37 | Communities and Ecosystems | |
| Ch 34 | The Biosphere: An Introduction to Earth's Diverse Environments | |
| Ch 38 | Conservation Biology | |
| Ch 31 | Plant Structure, Growth, and Reproduction | **Plant anatomy & Physiology** |
| Ch 32 | Plant Nutrition and Transport | |
| Ch 33 | Control Systems in Plants | |
| Ch 20 | Unifying Concepts of Animal Structure and Function | **Animal anatomy & Physiology** |
| Ch 21 | Nutrition and Digestion | |
| Ch 24 | The Immune System | |
| Ch 26 | Hormones and the Endocrine System | |
| Ch 28 | Nervous Systems | |

**Class curriculum & Textbook Reading Schedule – Miller & Levine Biology**

| | Miller & Levine Biology | Theme |
|---|---|---|
| Ch 1 | The Science of Biology | **Intro** |
| Ch 2 | The Chemistry of Life | **Biochemistry** |
| Ch 7 | Cell Structure and Function | **Cell Biology** |
| Ch 8 | Photosynthesis | |
| Ch 9 | Cellular Respiration | |
| Ch 10 | Cell Growth and Division | |
| Ch 11 | Introduction to Genetics | **Genetics** |
| Ch 12 | DNA | **Molecular Biology** |
| Ch 13 | RNA & Protein Synthesis | |
| Ch 14 | Human Genome | |
| Ch 15 | Genetic Engineering | |
| Ch 16 | Darwin's Theory of Evolution | **Evolution** |
| Ch 17 | Evolution of Populations | |
| Ch 19 | History of Life | |
| Ch 20 | Viruses and Prokaryotes | **Microbiology** |
| Ch 29 | Animal Behavior | **Ecology** |
| Ch 5 | Populations | |
| Ch 4 | Ecosystems and Communities | |
| Ch 3 | The Biosphere | |
| Ch 6 | Humans in the Biosphere | |
| Ch 22 | Introduction to Plants | **Plant Anatomy & Physiology** |
| Ch 23 | Plant Structure & Function | |
| Ch 24 | Plant Reproduction & Response | |
| Ch 25 | Introduction to Animals | **Animal Anatomy & Physiology** |
| Ch 26 | Animal Evolution & Diversity | |
| Ch 27 | Animal Systems - I | |
| Ch 28 | Animal Systems - II | |
| Ch 30 | Digestive & Excretory Systems | |
| Ch 31 | The Nervous System | |
| Ch 32 | Skeletal, Muscular, & Integumentary Systems | |
| Ch 33 | Circulatory & Respiratory Systems | |
| Ch 34 | Endocrine and Reproductive Systems | |
| Ch 35 | Immune System and Disease | |